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Using a citizen science tool to model the health benefits of roadside trees

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Using a citizen science tool to model the health benefits of roadside trees

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@treezilla_org



Health effects of air pollution

Cardiovascular and pulmonary diseases linked to transportation



40,000
deaths

20 billion
pounds



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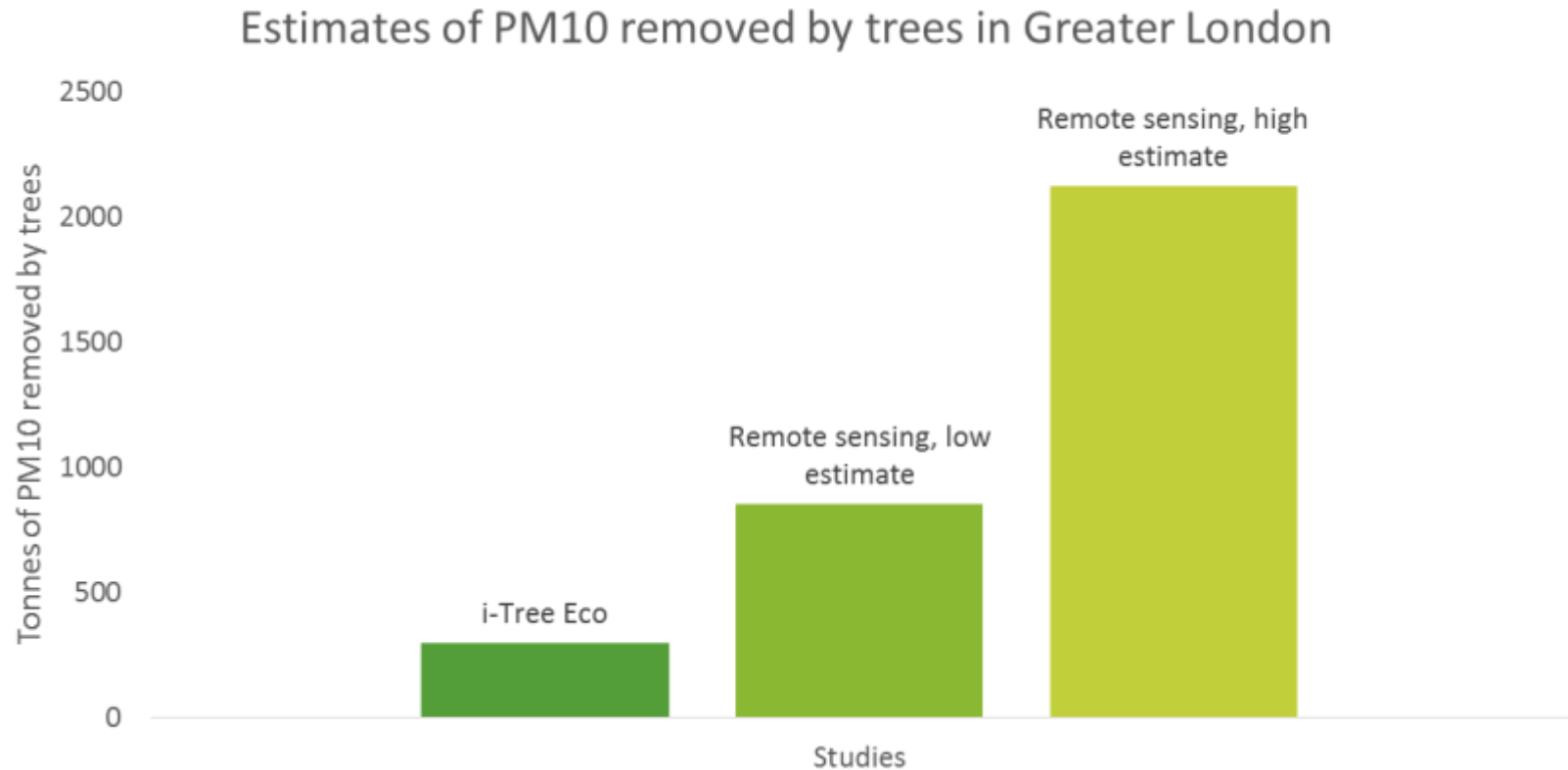
Roadside trees improve the urban environment

- Provide shade
- Slow cars down
- Reduce the urban heat island effect
- Filter air pollution



Previous studies on trees and particulate matter

- i-Tree Eco (Rogers et al., 2015)
- Remote sensing (Tallis et al., 2011)



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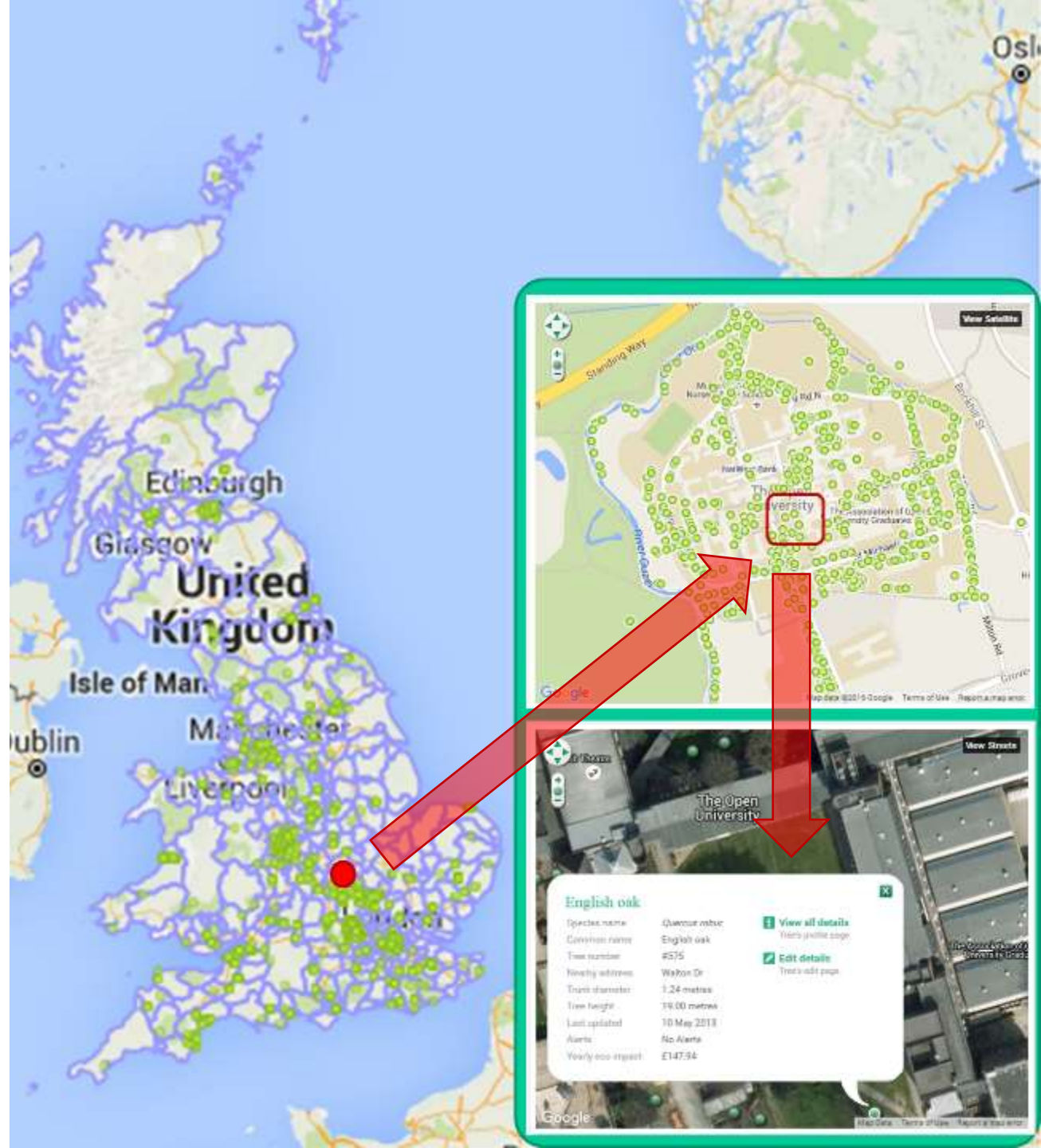


Valuing trees the citizen science way

- OpenTreeMap: learning about the value of individual trees
- Treezilla: developing a 'monster map of trees' for GB



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Project **VITAL**: **V**aluing Green **I**nfrastructure Through **T**ree **A**ssessment Tools

We're making a monster map of Britain's trees.
Use Treezilla to record the trees near you and
to find out how they benefit the local environment.



Get started,
map and measure
a tree today.



Learn how to use
Treezilla



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Benefits of a citizen science approach

Treezilla.org is a platform that can help:

- Highlight the role of trees in urban environments and the ecosystem services they provide
- Help the general public learn and contribute
- Acknowledge this contribution and its role in the care and welfare of trees



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Add a New Tree

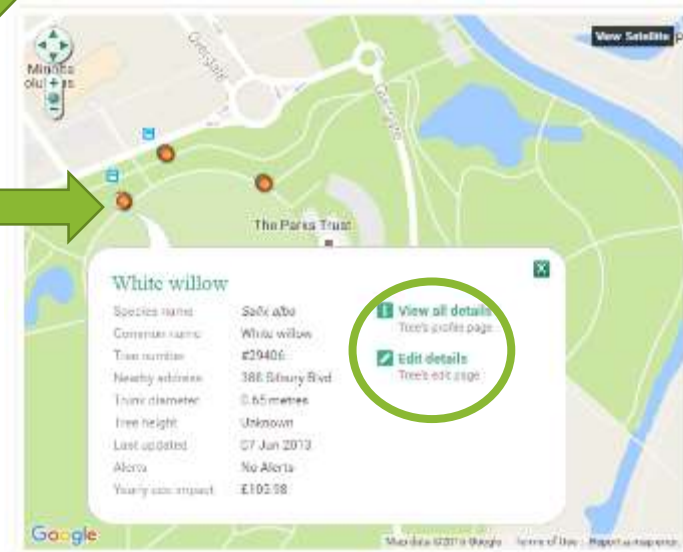
Step 1 Enter an address

1 High Street

Choose

Step 2 Specify Placement

Click-and-drag the orange circle to move it to the correct location



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Using Treezilla to study the removal of PM_{10} by roadside trees



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Grid roads and their trees

- Milton Keynes: a new town planned with a network of grid roads
- Unintended benefits of ‘screening’ the roads



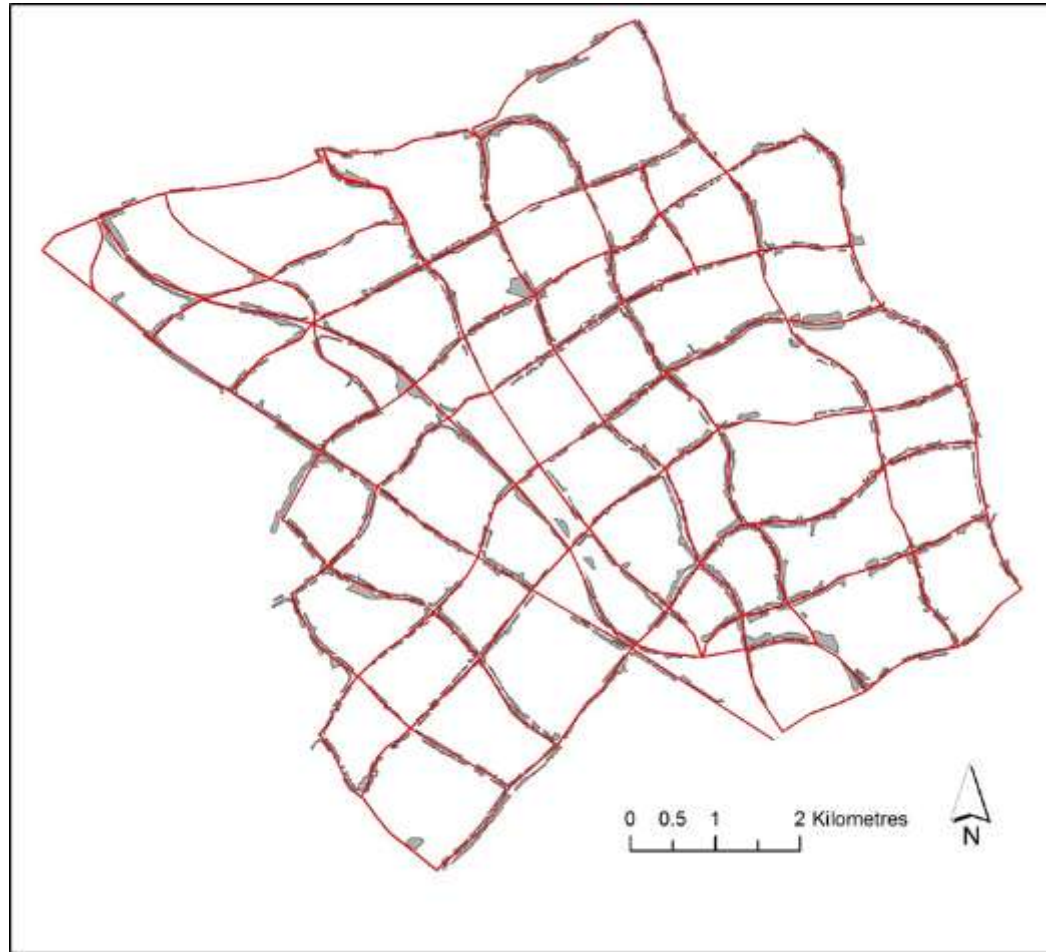
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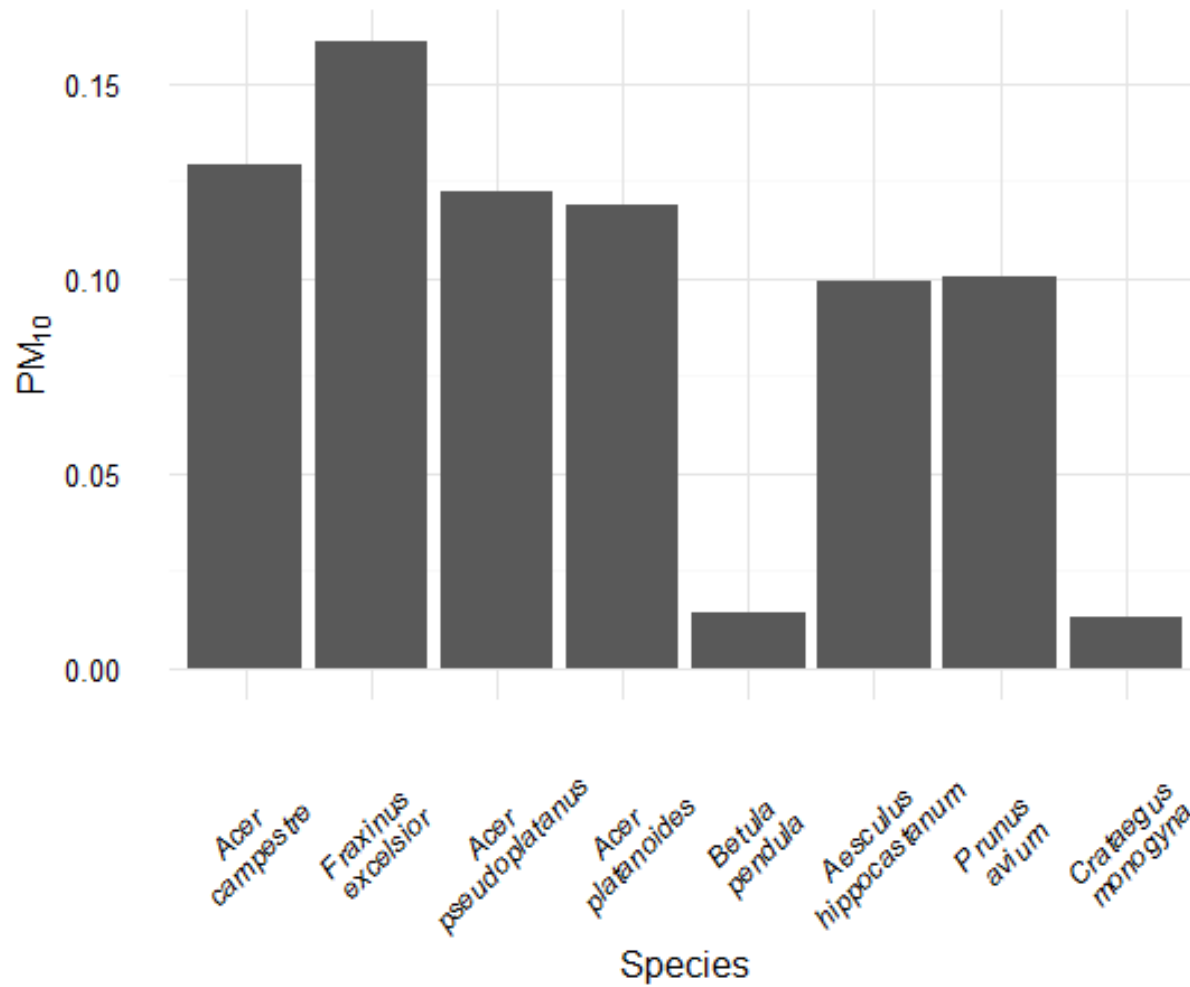
Grid road trees mapped: ~430ha within 50m of carriageway



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Proportion of PM₁₀ removal by 8 most common species



PM₁₀ removal across MK

- 22.36 kg/ha
- 9.6 tonnes overall for the planted area of grid roads in MK
- 5.5-6.3% of estimated annual exposure for the high and low pollution scenarios respectively



Managing roadside trees

Thinning to:

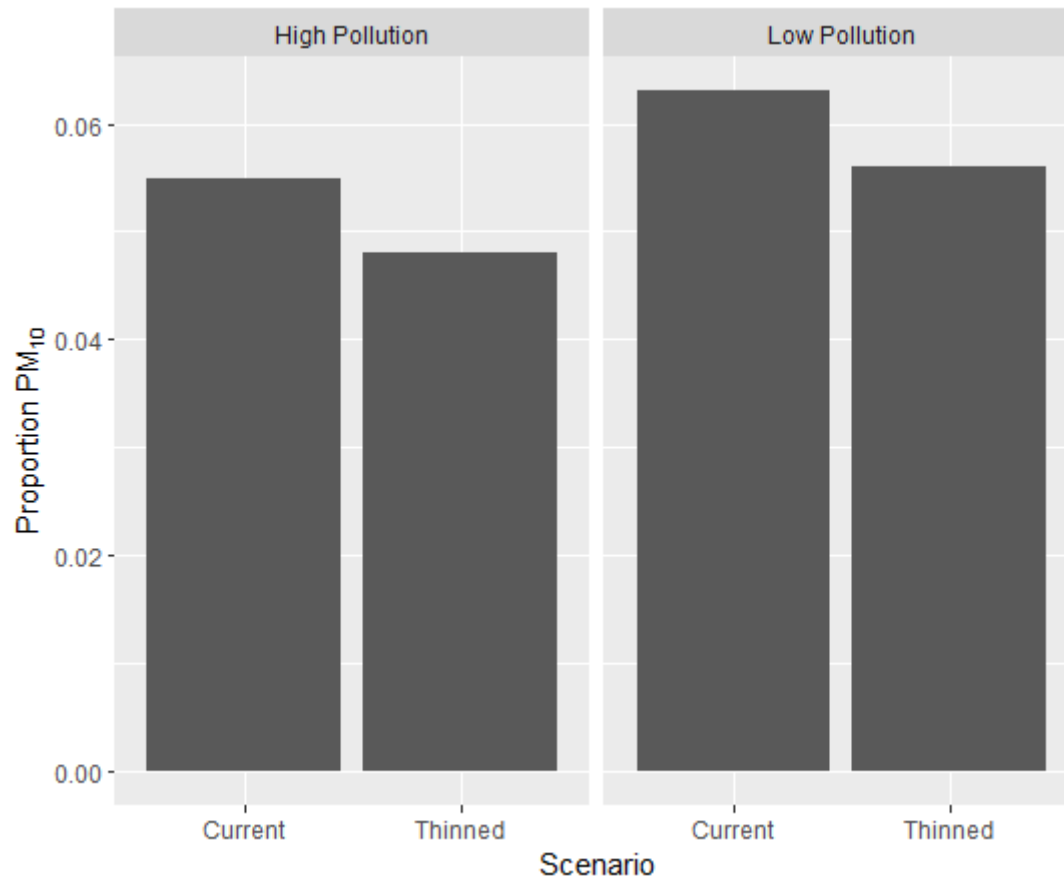
- Promote larger trees
- Improve visual amenity
- Increase ground flora diversity



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Effects of thinning on PM₁₀ removal



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Value of pollution reduction

In Treezilla:

- £14,568 under current conditions;
- £12,998 under the thinning scenario.

By UK government figures:

- £637,115 under current conditions;
- £568,445 under the thinning scenario.

Challenges

- Mapping at street level difficult with consumer GPS
- Co-ordinating citizen scientists at scale
- Which figures to believe: PM_{10} and £££?



Conclusion

- A citizen science tool can provide sensible ball-park estimates of PM_{10} removal.
- Uncertainties remain over precision of estimates and associated valuations.

But these are not specific to the citizen science approach

- Future developments will enhance the ability of Treezilla to contribute to baseline assessments and decisions over management.

Acknowledgements

Project team



The Open
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Project partners



Project VITAL
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